

**ADDENDUM TO “DRAFT ECONOMIC ANALYSIS OF
PROPOSED CRITICAL HABITAT DESIGNATION FOR O‘AHU PLANTS,
ISLAND OF O‘AHU, HAWAI‘I”¹**

1. INTRODUCTION

In May 2002, the U.S. Fish and Wildlife Service (the Service) proposed designation of critical habitat under the Endangered Species Act of 1973, as amended (the Act) for the O‘ahu Plants (the Plants). This proposal encompassed approximately 111,364 acres on the island of O‘ahu in Hawai‘i. Because the Act requires an economic analysis of the proposed critical habitat designation, the Service released a “Draft Economic Analysis of Proposed Critical Habitat Designation for O‘ahu Plants, Island of O‘ahu, Hawai‘i” (hereafter the DEA) for public review and comment in December 2002.²

The primary purpose of this Addendum is to update the DEA. Accordingly, the Addendum revisits the assumptions and analytic conclusions presented in the DEA in light of new information obtained since the DEA was published. It also addresses issues raised in public comments on the DEA.

2. EXCLUDED AND REDUCED UNITS

As a result of new information received by the Service during the public comment period, the Service has determined that certain areas in the proposed critical habitat either do not contain the *primary constituent elements* for the Plants, or are not essential for the conservation of the species. Based on these biological reasons, the Field Office is proposing to remove four units (Units C, M, P, V) and modify 12 units (Units A, B, D, E, F, G, I, L, O, W, X1 and X2) from the proposed designation (see Figure Add-1 at the end of this Addendum).³ With the intended modifications, the

¹ A draft of this Addendum was prepared by Decision Analysts, Hawai‘i, under subcontract to Industrial Economics, Incorporated (IEc), under contract to the Service's Division of Economics. This Addendum may, however, incorporate changes made to that draft by the U.S. Department of the Interior.

² Copies of the DEA are available from the Pacific Islands Fish and Wildlife Office, U.S. Fish and Wildlife Service, Honolulu, Hawai‘i.

³ The Field Office is proposing to redraw the boundaries of the critical habitat in the final rule to reflect these modifications (memorandum to Chief, Branch of Listing from Field Supervisor, Pacific Islands Office, Honolulu, Hawai‘i, February 13, 2003).

total acreage would be reduced from 111,364 acres to 82,396 acres—a decrease of 28,968 acres (26 percent). Table Add-1 at the end of this Addendum presents the acreages for the proposed critical habitat, the intended critical habitat, and the corresponding changes by critical habitat unit, State land-use district, and land ownership. The preamble to the final rule will explain the Service’s modifications to the proposed critical habitat designation. Henceforth, the terms “proposed designation,” “proposed critical habitat,” and “proposed unit” refer to the designation as contained in the proposed rule, and “intended designation,” “intended critical habitat” and “intended unit” refer to the designation with the above intended modifications.

3. METHODOLOGY

The analysis in the DEA incorporated two baselines: one that addressed the impact of the proposed critical habitat designation that may be attributable coextensively to the listing of the species, and one that addressed the incremental impact of the proposed designation.

This Addendum utilizes only the first of the two baselines. Because of the uncertainty about the benefits and economic costs resulting solely from critical habitat designations, the Service believes that it is reasonable to estimate the economic impacts of a designation utilizing this single baseline. It is important to note that the inclusion of impacts attributable coextensively to the listing does not convert the economic analysis into a tool to be used in deciding whether or not a species should be added to the Federal list of threatened and endangered species.

4. DIRECT SECTION 7-RELATED COSTS

The intended modifications to the proposed critical habitat affect some of the direct section 7-related costs estimated in the DEA. This section of the Addendum revisits these costs, and estimates new ones based on the intended designation. Table Add-2 at the end of this Addendum presents the costs in the DEA and the revised costs developed in this Addendum, and provides brief explanations for the changes.

The number of consultations and the anticipated project modifications in the DEA and this Addendum are based on the professional judgments of the consultants who prepared these two reports. These judgments are based upon (1) a review of the Service’s historical section 7 consultation files for the Plants, and other documents; and (2) discussions with the Service, affected landowners, government agencies, and stakeholders.

4.a. State and County Parks

Chapter VI, Section 3.b.(4) of the DEA discussed the possible future creation of a nature preserve or a native plants botanical garden in proposed Unit L at the back of Wailupe Valley (Aina Haina Nature Preserve). The DEA estimated that no section 7 costs would be associated with this preserve because the improvements have no known *Federal involvement*.

The Service indicates that it intends to modify the proposed critical habitat designation for the biological reasons given in Section 2 above. With these intended modifications, the area planned for the nature preserve would not be included in the intended designation, so there would be no section 7 costs for State and county parks. Because no section 7 costs were estimated previously, the Addendum makes no changes to the cost-estimates.

4.b. Conservation Projects

Chapter VI, Section 3.d.(2) of the DEA presented estimates of section 7 costs related to the acquisition of land in Unit M to add to the James Campbell National Wildlife Refuge and related flood control projects. The DEA estimated total section 7 consultation costs at \$8,000 to \$11,900, with minor project modification costs. The Service intends to modify the proposed designation for biological reasons such that proposed Unit M would not be included in the intended designation. Thus, this analysis anticipates no section 7 costs associated with the acquisition of land in proposed Unit M and related flood control projects.

4.c. Communications Facilities

Chapter VI, Section 3 of the DEA discussed sites at Palehua in proposed Unit I and at Koko Head in proposed Unit W. Palehua hosts the largest complex of communications towers on O‘ahu, and Koko Head is uniquely situated for telecommunications and navigational relay stations.

The DEA estimated that ten to twelve additional towers would be constructed at Palehua over the next 10 years, for total section 7 consultation costs of \$81,000 to \$97,000, and project modification costs of \$0 to \$120,000. At Koko Head, the DEA projected potential construction of a new communications tower and related infrastructure, and estimated the total section 7 consultation costs at \$8,100, with “minor” project modification costs.

The Service intends to modify the proposed designation for biological reasons to exclude the area surrounding the Palehua and the Koko Head communications complexes. Thus, this analysis anticipates no section 7 costs associated with future construction of communications facilities at these two locations. No changes are made in estimated section 7 costs for other communications sites.

4.d. Farming

Chapter VI, Section 3.g. of the DEA discussed land in proposed critical habitat Unit I that is being actively farmed in pineapple. The section 7 costs were not addressed in the DEA because the pineapple lands did not contain the *primary constituent elements* for the Plants, so there would have been no impact on critical habitat. The Service indicates that it intends to modify the proposed designation so that the intended designation will not contain the pineapple lands. Thus, this analysis still anticipates no section 7 costs associated with farming.

4.e. Ranching

Chapter VI, Section 3.h. of the DEA presented estimates of section 7 costs related to ranching activities. Specifically, the DEA noted that about a half-dozen ranchers use approximately 10,000 acres in Units A and I in the proposed critical habitat for grazing cattle and other livestock. The DEA further noted that these operations could have *Federal involvement* if the rancher were to receive a grant from the National Resources Conservation Service (NRCS) of the U.S. Department of Agriculture (USDA) to adopt certain land-management practices, or a loan from the Federal Farm Service Agency (FSA) or other USDA programs, or emergency funding from the FSA. The DEA estimated that between zero and five consultations would occur over the next 10 years at a cost of \$0 to \$86,000 with minor project modification costs.

Since the Service intends to modify the proposed designation to remove a significant amount of grazing land for biological reasons, the amount of land within the intended designation that would be used for ranching amounts to about 2,000 acres, and involves about three ranches. In view of the intended modification, this analysis estimates the economic impacts as shown below.

Consultations and Cost: \$0 to \$54,700

Estimate based on (1) zero to three consultations in the next 10 years; (2) the Low to Medium cost (from Table VI-1 of the DEA) of a consultation with a Federal agency as the applicant; and (3) if needed, two biological surveys of a 100-acre open site with Easy to Medium access (from Table VI-2 of the DEA). All of the consultation costs are conservatively assigned to the Plants, even though the consultation may also address listed wildlife species.

Individual ranchers are notified about the consultations but are generally not directly involved in the consultation process for NRCS projects (NRCS, 2002). The FSA indicates that for direct FSA loans, individual ranchers will be included in the consultation process and, for loan guarantees, the lending agency will be included in the consultation (FSA, 2002). For emergency funding from the FSA, the Service expedites consultations, so the rancher is not likely to be involved.

Anticipated Project Modifications and Cost: Minor

Because projects sponsored by NRCS are generally beneficial to the environment, project modifications, if any, are likely to be minor. Regarding FSA projects, Service guidelines state that project modifications must be economically and technically feasible. Since the profit margins for grazing operations are typically small, the total economic impact is likely to be modest. Furthermore, a rancher may choose to use FSA funds on projects that do not have adverse impacts on listed plants or their habitats.

4.f. Aquaculture

Chapter VI, Section 3.i. of the DEA discussed the aquaculture operations near proposed Unit M. Discharge water from the ponds is pumped into the ocean via a pipeline that crosses proposed Unit M. The DEA estimated that the proposed designation would have little or no economic impact on aquaculture because activities in proposed Unit M involve the operations and maintenance of an existing man-made facility.

The Service intends to remove proposed Unit M for biological reasons. Thus, there will be no section 7 costs related to aquaculture.

4.g. Residential Use and Development

Chapter VI Section 3.o.(2) of the DEA presented estimates of section 7 costs associated with possible residential development. Specifically, the DEA recognized possible future residential development on about 8.5 acres of privately owned land in proposed Unit L, in the backs of the Niu and Aina Haina Valleys. In addition, the DEA recognized that it would be possible to construct homes on large lots in proposed critical habitat areas in the State Agricultural District. The DEA projected zero to three consultations and presented total section 7 consultation costs of \$0 to \$24,300 with minor project modification costs.

As noted previously, the Service intends to modify the proposed designation for biological reasons. With these intended modifications, the areas currently zoned for residential development in the backs of the Niu and Aina Haina Valleys would not be included in the intended critical habitat. In addition, the intended modifications significantly reduce the amount of Agricultural land in the intended designation. There are no known plans for large-lot subdivision development on the Agricultural land remaining in the intended designation. Thus, this analysis anticipates no section 7 costs associated with future residential development in the intended designation.

4.h. Landfill

Chapter VI, Section 3.p. of the DEA discussed the development of a private landfill in proposed Unit I in the foothills of the Wai‘anae Mountains above Kunia. Because the DEA saw no *Federal involvement* for this landfill, there were no section 7 costs estimated.

The Service intends to modify the proposed designation to remove areas for biological reasons. As a result of these intended modifications, the intended designation will not include the landfill. Thus this analysis anticipates no section 7 costs associated with the landfill.

4.i. U.S. Army Activities

Chapter VI, Section 3.q. of the DEA presented estimates of section 7 costs associated with activities in ten separate areas on O‘ahu that are under the control of the U.S. military. During public comment, the U.S. Army (the Army) stated that the cost-estimates for consultations and for possible project modifications on their installations were too low. This Addendum revisits the sections of the analysis addressing Army installations and provides revised cost-estimates based upon further discussions with the Service and additional information gathered since completion of the DEA, including the *O‘ahu Training Areas Integrated Natural Resources Management Plan 2002-2006* (OTA INRMP).

As discussed more fully in the DEA, the proposed designation overlaps with seven Army installations: Dillingham Military Reservation, Fort Shafter, Kahuku Training Area, Kawaihoa Training Area, Makua Military Reservation (MMR), Schofield Barracks–West and South Ranges, and Schofield Barracks–East Range. As noted previously, the Service indicates that it intends to modify the proposed designation for biological reasons. These intended modifications reduce, but do not remove entirely the amount of overlap between the proposed critical habitat and the installations. However, the planned expansion of Schofield Barracks–South Range no longer overlaps with the intended critical habitat. Of significance, the intended designation also overlaps with most of the Biologically Sensitive Areas identified in the OTA INRMP for each installation. Accordingly, the costs of certain management activities in critical habitat are attributable to this baseline INMRP, as discussed below.

As discussed in the DEA, possible activities within the intended designation include: (1) conservation and land management practices, including weed control, fire prevention, fencing, outplanting, and ungulate control; (2) non-live-fire maneuver training; (3) non-live-fire light-infantry training; (4) helicopter training; and (5) transformation-related activities, including converting Drum Road to an all-weather road and possibly developing a non-live-fire urban fighting training facility. In addition, possible activities outside the intended designation that could impact the intended designation include live-fire training at MMR and Schofield Barracks–West and South Ranges. However, the distance between impact zones and the intended units is greater than it was with the proposed units.

The DEA estimated section 7 costs by installation. However, the Army is about to initiate a formal section 7 consultation that covers the combined training activities and planned transformation-related activities for all Army installations on O‘ahu. Thus, rather than estimate section 7 costs by installation, this analysis provides a combined estimate of section 7 costs encompassing all the O‘ahu Army installations.

Consultations and Cost: \$386,000 to \$571,000

The analysis bases the above estimate on (1) two to three consultations; (2) three to four times the High cost of a consultation with a Federal agency as the applicant (from Table VI-I of the DEA); and (3) the following biological surveys: (a) one survey of 100 acres of open area with Easy to Medium access for Dillingham Military Reservation; (b) no biological surveys for Fort Shafter due to the lack of activities and minimal amount of overlap with the intended designation; (c) two biological surveys of 500 acres, one involving an open area with Medium access and one involving a forested area with Difficult access for Kahuku Training Area; (d) no biological surveys for Kawaihoa Training Area due to previous surveys; (e) two biological surveys of 100 acres of forested area with Medium to Difficult access for MMR; (f) two biological surveys, one of 100 acres of forested area with Medium to Difficult access and one of 500 acres of forested area with Difficult access for Schofield Barracks – West and South Ranges; and (g) one biological survey of 500 acres of forested area with Difficult access for Schofield Barracks – East Range (from Table VI-2 of the DEA).

As noted above, the number of consultations recognizes that the Army is about to initiate a formal section 7 consultation covering all installations on O‘ahu. In addition, this analysis anticipates that one to two additional comprehensive consultations might be required to address future military training activities. The analysis estimates the potential level of effort for these consultations at three to four times the High cost of a consultation with a Federal agency as the applicant (from Table VI-I of the DEA), recognizing that the consultations will involve several installations, different types of military activities, different types of terrain, and other potentially complex issues.

Project Modification Cost: \$7.7 million to \$18.8 million

The project modifications for current military training activities and the planned transformation-related activities would be developed during the formal section 7 consultation. At this early stage, it is difficult for the Service or the Army to predict the specific project modifications that might be required, as they would depend on the activities planned and the biological character of the area utilized. However, based on past experience with the Army, the Service indicates that it anticipates the following types of project modifications: (1) fire prevention and control; (2) species stabilization; and (3) modifications to training.

The Service indicates that it is likely to require more stringent fire-control practices, possibly including more rigorous evaluation of fire risks, improvements to fire management plans and their

implementation, better maintenance of firebreaks, construction of new firebreaks, feasibility studies and construction for new dip ponds, and prescribed burns where appropriate.

The Service also indicates that it could require management practices to maintain listed plant populations at stable levels. During public comment, the Army estimated that the cost of species stabilization at MMR is approximately \$8 million per year. Species stabilization was developed as part of the Makua Implementation Plan, which was developed to implement a 1999 Biological Opinion of the Service resulting from formal consultation regarding routine military training activities at MMR. Thus, this analysis assumes that the cost of species stabilization at MMR is part of the baseline cost, so it is not included in the analysis. Based on discussions with the Service, the analysis anticipates that the cost of plant species stabilization at other installations will be lower than the stabilization effort at MMR for the following reasons:

- In addition to the Plants, the Makua Implementation Plan addressed four animal species.
- Many activities at other installations occur in areas having few or no listed plant populations.
- With the exception of Schofield Barracks–West Range, the type of training conducted at the other installations typically has a low impact on listed species, largely because there is no live-fire impact zone. This is in contrast to MMR where there is a live-fire zone.
- Many of the species are already covered by the species stabilization efforts contained in the Makua Implementation Plan.
- Future species stabilization plans might be able to utilize strategies developed for the Makua Implementation Plan.

Finally, the Service indicates that it could request modifications to training to avoid or minimize the impact on the Plants and their habitats. For example, live-fire training might be curtailed on days when the risk of fire is high due to dry vegetation and high winds. It should be noted, however, that the Service does not anticipate major modifications to training programs or the cessation of training. Further, the Service anticipates that the costs to modify training will be modest since many of the desired practices are already in place.

The Low and High cost-estimates for project modifications are based on the OTA INRMP covering the following categories, and with the following adjustments:

- The OTA INRMP identifies \$9.5 million of “Section 7 Consultation” costs that the Army anticipates will be included in the upcoming programmatic section 7 consultation for the 5-year period ending in 2002. This analysis doubles the figure

to \$19 million to cover a 10-year period, then discounts it to \$7.2 million to remove the 10-year Makua component which is part of the baseline. This figure is further discounted by 25 percent to account for the fact that the project modifications also cover listed animal species (e.g., birds and snails). Finally, this analysis reduces the sum by \$500,000 to remove costs attributable to consultations and related biological surveys. The net result is \$4.9 million. Even though these costs are included in the OTA INRMP, they are not part of the baseline since they are anticipated costs associated with a section 7 consultation that has not yet occurred.

- The OTA INRMP identifies a series of “Endangered Species Management Actions” costs as part of the “Endangered Species Management Program.” About \$9.5 million of these costs are designated with a funding class of “Other Environmental” or “Class 3.” These projects are needed to address overall environmental goals and objectives, but they are only implemented when funding becomes available. Without a section 7 consultation, this analysis assumes that these projects would remain “Class 3” and may not be funded or completed in the next 10 years. With a section 7 consultation, the Army may include some or many of these projects as part of the section 7 consultation, or the Service may include them as reasonable and prudent alternatives in a Biological Opinion of a section 7 consultation. If either occurs, then their funding class will become “Must Fund,” “Class 1,” or “Class 2,” and these projects will be funded and completed by established deadlines. For the Low estimate, this analysis assumes that none of these projects will be included in the section 7 consultation except for those at Makua which have already been addressed in a section 7 consultation. To derive the High cost-estimate, the above \$9.5 million cost-estimate is doubled to \$19 million to cover a 10-year period. This sum is discounted to \$16.6 million to remove the 10-year Makua component which is part of the baseline. This figure is discounted by 50 percent to account for the fact that the project modifications also cover listed animal species (e.g., birds and snails), as well as conservation management projects that go beyond species stabilization. The net result is a Low estimate of \$0 and a High estimate of \$8.3 million.
- The OTA INRMP identifies \$3.6 million of “Wildland Fire Program” costs. This analysis doubles the figure to \$7.2 million to cover a 10-year period, then discounts it by 75 percent to account for the fact that fire management would occur even without listed species; also, a portion of the cost is assigned to listed animal species (e.g., birds and snails). The net result is \$1.8 million.
- The Service indicates that additional project modifications may be agreed to after critical habitat is designated. Based on discussions with the Service and the amount of *unoccupied* land in the intended designation, this analysis increases the Low estimate by 15 percent to account for additional project modifications due to critical habitat, resulting in a total cost of \$7.7 million ((\$4.9 million + \$0 million + \$1.8 million) + 15%).

- The High estimate is increased 25 percent to account for additional project modifications due to critical habitat, resulting in a total cost of \$18.8 million ((\$4.9 million + \$8.3 million + \$1.8 million) + 25%).

4.j. Unchanged Direct Section 7-Related Costs

In the cases below, the analyses of direct section 7-related costs in the intended units are the same as they appear in the DEA:

- Section 3.a. Management of Game Hunting
- Section 3.c. Watershed Projects
- Section 3.f. Power Transmission Lines
- Section 3.j. Irrigation-Ditch System
- Section 3.k. Potable-Water Systems
- Section 3.l. Highways
- Section 3.m. Hiking Trails and Unpaved Access Roads
- Section 3.q.(8) Hawai'i Army National Guard, Diamond Head Crater
- Section 3.q.(9) Naval Magazine Pearl Harbor, Lualualei Branch
- Section 3.q.(10) Naval Radio Transmitter Facility Lualualei
- Section 3.r. Natural Disasters

5. INDIRECT COSTS

The intended modifications to the proposed critical habitat will affect some of the indirect costs presented in the DEA. The material below revisits these costs, while Table Add-2 summarizes the differences between indirect costs in the DEA and this Addendum. For many of the costs, uncertainty exists regarding their magnitude, or the probability that a cost will in fact occur, or both.

5.a. U.S. Military Activities

Chapter VI, Section 4.c. of the DEA discussed the possibility that critical habitat designation could have an indirect impact on U.S. military activities. Specifically, if critical habitat designation were to compromise certain operations of the Army, the U.S. Navy (the Navy), or the U.S. Marine Corps (Marine) (which may or may not be a realistic assumption), it could compromise national defense. Since the Army indicates that it has a shortage of land suitable for live-fire and maneuver training, the Army suggests that new constraints on these operations could risk the loss of lives, expensive equipment, and even military missions in future conflicts. And if the 25th Infantry Division (Light) ((25th ID (L)) or other Army or Marine units were to be moved outside Hawai'i because of inadequate land for training in Hawai'i, the Army indicates that a reduction in readiness would result. In addition to the impact on national defense, Hawai'i's economy would be adversely affected if units or operations were to relocate outside the State (Army, 2002). The DEA did not

estimate the potential economic impact of relocation or its probability, but did characterize the potential cost as “very large” if it were to occur.

During public comment, the Army noted that an estimate of military spending is available. In addition, the Army commented that the designation of critical habitat creates training restrictions that could preclude training that would meet Army standards, or necessitates ‘work-arounds’ that increase training costs. Finally, the Army stated that it believed it could be subject to third-party lawsuits by entities seeking to limit training exercises in critical habitat or seeking stronger conservation management of Army lands.

As noted in Section 4 above, the Army is about to enter into a formal section 7 consultation with the Service covering existing military training and transformation-related activities on all Army installations on O‘ahu. The Service anticipates the need for project modifications, but the Service does not anticipate major modifications to existing or planned training, or the cessation of training.

For illustration, if the intended designation were to result in indirect impacts that result in a decision by the Army to relocate their military training outside the State, the costs could be expressed in terms of lost Federal military funds in Hawai‘i. As discussed briefly in the DEA and in the Addendum, the Army has proposed to transform the 25th ID (L) at Schofield Barracks into one of several nationwide Stryker Brigade Combat Teams (SBCT, formerly known as Interim Brigade Combat Team or IBCT). If a lawsuit or other indirect impact makes it too difficult to implement the planned construction projects and training exercises, the Army could choose to transform a division in another state into the SBCT. The Army plans to spend \$693 million in direct construction costs in Hawai‘i to support transformation. These Federal funds would be lost to Hawai‘i if the Army does not continue with current transformation plans (Army, 2002). In addition, the Army spent \$677 million on payroll, \$249 million in contracts, and \$690 million on supplies, equipment and services in Hawai‘i in fiscal year 2001 (Army, 2002).

The above figures illustrate the scope of the Army’s presence in Hawai‘i. However, this analysis anticipates that it is unlikely that the intended designation will cause the Army to relocate its military training operations outside Hawai‘i. This conclusion is based upon the following factors:

- The importance to national security of Hawai‘i’s strategic location in the center of the Pacific.
- Most of the intended critical habitat on military land on O‘ahu constitutes safety and buffer zones and does not host live-fire training or training using land vehicles.
- The OTA INRMP recognizes much of the intended critical habitat designation as Botanically Significant Areas and sets forth a comprehensive management plan to manage these natural resources while sustaining the Army’s capability to successfully achieve its mission.

5.b. Communications Facilities and Services

Chapter VI, Section 4.d. of the DEA discussed the indirect impacts of the proposed designation on communications facilities and services. The DEA noted the concern that the proposed critical habitat could result in the loss of one or more communications towers at the major communications complex at Palehua. The DEA also indicated that the cost of such a loss could be very high. However, the DEA did not forecast the loss of new towers because (1) new towers are expected to locate in areas removed from existing populations of listed plants, and (2) the Service is obligated to suggest reasonable and prudent alternatives in the event of adverse impacts.

As noted above, the Service intends to modify the proposed critical habitat for biological reasons. Because the Palehua and Koko Head complexes are not included in the intended designation, the risk of losing communications facilities at these two sites no longer exists. Thus, this analysis estimates that the potential loss of communications facilities as a result of indirect effects of critical habitat designation is zero for the Palehua and Koko Head complexes. However, since smaller communications complexes are located in the intended critical habitat and some additional development is possible at these sites, this analysis estimates that there is a very low probability that communications facilities could be displaced at these sites as a result of indirect effects of the intended designation. For the most part, communications facilities at these smaller complexes are of secondary importance compared to those at Palehua.

5.c. Landfill

Chapter VI, Section 4.e. of the DEA discussed the indirect impacts of the proposed designation on the development of a planned private landfill. The DEA noted that there is a risk that the proposed designation could increase the difficulty of obtaining permits and approvals, and could possibly derail the landfill project. However, as indicated in Section 4.h above, the landfill is not included in the intended designation. Thus, this analysis concludes that the indirect impacts presented in the DEA will not occur.

5.d. Mandated Conservation Management

Chapter VI, Section 4.f. of the DEA estimated possible costs associated with managing all of the land in critical habitat for the benefit of the Plants. The DEA concluded that such costs could occur as a result of court-ordered conservation management, although the probability of such a court order was “small.”

Similarly, this analysis concludes that court-ordered conservation management of all lands designated as critical habitat is not reasonably foreseeable. The concern expressed by some is that the prohibition on *taking* endangered and threatened species could be triggered by designation of critical habitat if courts apply the principles of *Palila v. Hawai‘i Dept. of Land and Natural Resources*, 471 F. Supp. 985 (D Haw. 1979) *aff’d* 639 F.2d 495 (9th Cir. 1981) and *Palila v. Hawai‘i Dept. of Land and Natural Resources*, 649 F. Supp. 1070 (D. Haw. 1986), *aff’d* 852 F.2d

1106 (9th Cir. 1988). However, while critical habitat may provide information to help a landowner identify where *take* through habitat modification may occur, the Federal and State *take* prohibitions are triggered by the listing of a species and would apply whether or not critical habitat has been designated. *Palila* did not announce a rule that degradation of designated critical habitat constituted *take*. While the circumstances considered by these cases happened to occur in the *palila*'s critical habitat, the legal issues involved interpretation of "harm" in the Federal ESA's definition of *take*. *Take* of a listed wildlife species may occur inside or outside of critical habitat if it causes death or injury to the species. The link between critical habitat designation and the *take* prohibition is even more attenuated when applied to listed plants because the applicable prohibitions are not the same as those applicable to listed wildlife and do not include the prohibition on "harm" that was at issue in *Palila*. Likewise, there is no indication in Hawai'i State law that critical habitat would trigger the *take* prohibition; in fact, there is no mention of critical habitat in the State endangered species law. See HRS 195D-1 *et seq.* Further, there is no private right of action to enforce the State's *take* prohibitions. Finally, no other Federal, State, or county law or regulation mandates conservation management for critical habitat.

Accordingly, this analysis does not present a revised estimate of the cost to manage all of the land in critical habitat for the benefit of the Plants.

5.e. Redistricting of Land by the State

Chapter VI, Section 4.g. of the DEA discussed the concern that once critical habitat is designated, the State might redistrict land in the critical habitat from the State Agricultural or Urban District to the Conservation District. In particular, the DEA noted the concern that this could result in (1) a substantial reduction in the value of the land; (2) lost current or potential agricultural use of the land; (3) higher property taxes because Conservation land can be assessed at a higher value than can Agricultural land; and (4) reduced ability to secure bank financing.

Likelihood of State Agency-Initiated Redistricting

The DEA recognized that the concern about potential redistricting of land designated as critical habitat stems from the interplay between two State statutes, HRS chapter 195D and HRS chapter 205. Specifically, HRS 195D-5.1 provides that State Department of Land and Natural Resources (DLNR) "shall initiate amendments to the Conservation District boundaries ... in order to include high quality native forests and the habitat of rare native species of flora and fauna within the Conservation District." HRS 205-2(e) defines the Conservation District, and provides that, among other areas, it shall include areas necessary for "conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered." In addition, the DEA noted that critical habitat could prompt the Department of Business, Economic Development and Tourism's (DBEDT's) Office of Planning (OP) to consider a petition to the State Land Use Commission (LUC) to redistrict land from the Agricultural, Rural or Urban Districts to the Conservation District. This would likely occur during the periodic review of State District boundaries.

The DEA concluded that State agency initiated redistricting of privately owned land was likely to occur in only a limited number of cases. The Addendum makes no changes to this conclusion. This assessment is based on the following:

- State law only permits State and county departments and agencies and persons with a property interest in the land to be reclassified to petition for redistricting (HRS 205-4). A third-party cannot petition for redistricting.
- Critical habitat designation alone would not prompt the State to propose redistricting. Instead, a number of other factors would come into play, such as the quality of the native habitat, the value of the land as watershed, slopes, wetlands, special streams, scenic and open areas, etc. (DBEDT, Office of Planning). And while the LUC is specifically directed to consider the impact of the proposed reclassification on “the preservation or maintenance of important natural systems or habitats,” it is also specifically directed to consider five other impacts in its decision:
 - (1) the “maintenance of valued cultural, historical, or natural resources;”
 - (2) the “maintenance of other resources relevant to Hawai‘i’s economy, including, but not limited to, agricultural resources;”
 - (3) the “commitment of State funds and resources;”
 - (4) the “provision for employment opportunities and economic development;” and
 - (5) the “provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups.” (HRS 205-17).
- The relevant State statutes contains no reference to designated critical habitat. And unlike the automatic conferral of State law protection for all federally listed species, State law does not require initiation of the amendment process for federally designated critical habitat. (Compare HRS § 195D-5.1 with HRS § 195D-4(a)).
- Private landowners typically oppose proposals to redistrict their lands if they believe this might result in a decrease in property value and/or a loss in the economic use of their lands (discussions with landowners, 2002). The LUC must hold a hearing on all petitions to redistrict areas greater than 15 acres, and must admit as intervening parties all persons who have some property interest in the land, thus giving private property owners opposing redistricting the opportunity to present evidence (HRS 205-4).
- Approval of redistricting requires six affirmative votes from the nine commissioners, with the decision based on a “clear preponderance of the evidence that the proposed boundary is reasonable.” (HRS 205-4). Thus, the LUC can deny redistricting petitions and leave habitats of threatened and endangered species in a district other than the Conservation District.

- In the last State District boundary review, only five privately owned parcels were redistricted to Conservation, even though several hundred parcels were proposed for redistricting. This included a stream and a watershed on Maui, two beaches on Kaua'i, and a pu'u (small crater) on the Island of Hawai'i.
- Finally, land designated critical habitat has remained in districts other than the Conservation District. For example, all or portions of existing critical habitat for two listed plant species (*Gouania hillebrandii* and *Kokia drynarioides*), both designated in 1984, are within the State's Agricultural District.

The intended designation contains private agricultural land that is not prime agricultural land, and some private urban land that is not suitable for development. Assuming that some or all of this land were to be redistricted to Conservation then, for the foreseeable future, redistricting would not significantly impact the commitment of State funds and resources, the provision for employment opportunities and economic development, or the provision of housing. Thus, this analysis assumes that it is reasonably foreseeable (moderate to high probability) that the LUC would redistrict some of this land to the Conservation District as a result of the intended designation. The most likely parcels to be redistricted would be those which have high value for conservation and low economic value. However, based on the points listed above, this analysis judges the probability that all of the parcels will be redistricted to be very low to low.

Likelihood of Court-Ordered Redistricting

As discussed in the DEA, if a State agency (either the OP or DLNR) does not petition the LUC to redistrict land in critical habitat to the Conservation District according to HRS 205-2(e), then there is a risk that (1) a third party would file one or more lawsuits to force such petitions and (2) the lawsuits could be successful. This assessment is based on conversations with landowners, environmental groups, and others familiar with the subject. However, even if the lawsuit is successful, it would still be up to the LUC to determine which parcels to redistrict, as mentioned above.

If the LUC does not redistrict land in critical habitat to the Conservation District, a third-party could challenge the LUC decisions in court. This analysis assumes that the lawsuit would be successful only if the plaintiff could prove that the LUC did not make its decision according to the process and criteria outlined above. Thus, this analysis assumes that a lawsuit filed to mandate redistricting could be successful for some parcels, particularly those having high value for conservation and low economic value.

Cost of Contesting Redistricting

Even though the probability may be low that the State will redistrict a particular privately owned parcel to Conservation, the landowner can spend time and money to contest a proposed

redistricting. Based on the last boundary review, some landowners report spending over \$50,000. However, in the event of a lawsuit to force redistricting, the costs would be much higher.

New Restrictions on Land

Even if land is not redistricted, the State may seek agreements with landowners to protect the habitats of listed species as an incentive to retain their existing State District designation. Based on the last boundary review, this could involve agreements to reforest lands using native species, or to not subdivide or develop land that is habitat for listed species. Such requirements restrict future land use, thereby lowering property values.

Affected Lands

The DEA reported that the proposed designation contains approximately 10,937 acres of Agricultural land, including about 9,000 acres of privately owned land, and approximately 392 acres of Urban land. Since the Service intends to modify the proposed designation, this will reduce the amount of land in the intended designation that could be affected by redistricting. The intended designation includes (1) approximately 3,319 acres of Agricultural land, of which 2,070 acres are privately owned; and (2) approximately 0.6 acre of Urban land, of which about 0.2 acre is privately owned. For the reasons mentioned above, it is reasonably foreseeable (moderate to high probability) that some of this land will be redistricted to the Conservation District as a result of the intended designation. This analysis judges the probability that all of the parcels will be redistricted to be very low to low.

Reduction in Land Values Due to Redistricting

The DEA estimated that reductions in land values due to State redistricting from the Agricultural District to Conservation could range from less than \$5,000 per acre for remote Agricultural land having steep slopes and difficult access, to more than \$30,000 per acre for land suitable for large-lot residential development. While the DEA recognized that for a particular parcel, the per-acre reduction in value resulting from redistricting would depend upon location, views, access, terrain, county plans, available infrastructure, development potential, etc., it estimated the average value at \$10,000 per acre (based on a general knowledge of appraised land values and discussions with landowners). The DEA also estimated that redistricting the land to the Conservation District could reduce the land value to about \$1,000 per acre (based on a general knowledge of appraised land values). Thus, redistricting all 2,070 acres of privately owned Agricultural land to the Conservation District would reduce land values by about \$18.6 million (2,070 acres x a \$9,000 per-acre reduction in value). In practice, however, only some of the parcels are likely to be redistricted.

As noted above, the intended designation includes about 0.2 acre of privately owned land in the Urban District. This land is distributed among three properties, the largest of which covers about 0.09 acre. Also, all three properties are located in areas having steep slopes that are not

suitable for development. Consequently, this analysis concludes that redistricting the privately owned Urban land within the intended designation to Conservation will have no significant economic impact.

5.f. State and County Development Approvals

Chapter VI, Section 4.h. of the DEA discussed how critical habitat would affect State and county development approvals. Based on discussions with State and county planning officials, the DEA found that certain State and county agencies would incorporate the designation into their approval processes and require developers to address the impacts of projects on critical habitat. Thus, for projects proposed for locations in critical habitat, the DEA found that the designation may increase the required level of environmental analysis, require project mitigation in case of adverse impacts to critical habitat, increase the cost and time for obtaining development approvals, and possibly increase the risk of project denial. However, over the next 10 years, the DEA expected the number of affected projects to be small because most of the proposed critical habitat units are (1) in mountainous areas that are unsuitable for development due to difficult access and terrain, and (2) within the State Conservation District where land-use controls severely limit development.

The Service intends to modify the proposed critical habitat by removing (1) all of the Urban land that is suitable for development, (2) much of the Agricultural that is suitable for development, and (3) the Palehua and Koko Head communications complexes. As a result of the intended modifications, the number of projects in critical habitat that will be subject to State and county review is now very small.

5.g. Reduced Property Values

Chapter VI, Section 4.i. of the DEA discussed the concern of landowners that their properties could lose value if they are included in critical habitat. Specifically, landowners have expressed concern that critical habitat designation could make their lands less valuable by restricting their potential use or their development potential, or by increasing landowners' land-management or development costs—i.e., changes that affect the time-stream of profits. In the short-term, this could include: (1) expenditures to contest State efforts to redistrict lands to Conservation; (2) possible expenditures on land management and restrictions on land use and development agreed to by landowners in order to avoid having their lands redistricted; and (3) in the event that 1 and 2 are unsuccessful, possible redistricting of lands to Conservation (see Section 5.e). In the long-term (i.e., beyond the 10-year time horizon), this could include: (1) more difficult and expensive development approvals; (2) mitigating measures that increase development costs or reduce development potential; and (3) in the event that mitigations are insufficient, possible denials of development projects (see Section 5.f). Thus, future profits from land use and development could be reduced or lost entirely as a result of indirect effects of the intended designation. The risks of these potential costs, restrictions on use, and lost future profits will lower current property values. The DEA recognized that even perceived changes could reduce property values, and that these reductions would last for as long as the perceptions persist.

The concern of landowners about reduced property values primarily involves land that is: (1) privately owned; (2) in the State's Agricultural, Urban or Rural District; and (3) suitable for eventual development or commercial use based on access, gentle slopes, proximity to infrastructure and services, pleasing views, etc. Agricultural land is included since most of its value reflects long-term development potential beyond the 10-year time horizon, not current and projected returns from agricultural use.

The DEA recognized that only a limited number of such properties are located within the proposed critical habitat, since most of the proposed designation is (1) owned by the government; (2) in the Conservation District; or (3) not suitable for development due to its location in mountainous areas having poor access or difficult terrain.

The DEA estimated that the total land value at risk exceeded \$91 million, based upon (1) approximately 9,000 acres of privately owned Agricultural land; (2) about 8.5 acres of Urban land; and (3) land in the Conservation District at Palehua that is well-suited for communications facilities. The DEA concluded that the actual loss in land value due to critical habitat will be some undetermined fraction of the \$91 million.

As discussed previously, the Service intends to modify the proposed critical habitat to remove areas for biological reasons. The intended modifications reduce the acreage of privately owned Agricultural land in critical habitat to about 2,070 acres; reduce the acreage of Urban land to less than one acre; and remove the area surrounding Palehua from critical habitat. As a result, this analysis estimates that the total land value at risk for the intended designation is approximately \$18.6 million, as calculated in Section 5.e. above. Based on the risks and potential costs, this analysis judges the loss in land value to be a small to moderate fraction of \$18.6 million. For specific properties, the percentage loss in land value (if any) will depend upon the circumstances.

5.h. Costs to Investigate Implications of Critical Habitat

Chapter VI, Section 4.k. of the DEA indicated that private landowners might want to investigate how critical habitat designation could affect (1) the use of their land (either through restrictions or new obligations), and (2) the value of their land. The DEA estimated the total cost of investigations at \$80,000 to \$400,000, assuming that 30 to 60 of the 125 private landowners potentially impacted by the proposed designation would spend approximately 15 to 25 hours investigating the implications of critical habitat.

Public comment noted that the cost-estimate in the DEA is too low considering the size of the proposed designation and uncertainties regarding the exclusion of "unmapped holes." The DEA recognized that some landowners might spend a great deal of time investigating the implications of critical habitat, while others might not spend any time. The cost reported in the DEA reflects a reasonable estimate of total costs for all landowners, based on an estimate of the number of landowners who are likely to investigate the implications of critical habitat. The estimate takes into account whether their land is in areas that are unsuitable for development due to mountainous terrain

and/or being in the Conservation District. The analysis also assumes an average cost per landowner to investigate the implications of critical habitat. Public comment did not offer an alternative estimate of time or costs that would support changing the estimate in the DEA. Thus the estimates of hours spent and costs incurred remain the same as they appear in the DEA.

However, the number of potentially affected private landowners has dropped from 125 in the proposed designation to 72 in the intended designation. Furthermore, only ten private landowners own an acre or more of land in the intended designation that is outside the Conservation District, and two of these are non-profit organizations. Thus, the cost of investigating the implications of critical habitat for the intended designation will be lower; the revised estimate ranges from \$26,500 to \$227,500. This estimate is based on the following assumptions: (1) ten to 35 landowners will investigate the implications of critical habitat; (2) landowners and their attorneys or professional staff will spend an average of about 15 to 25 hours on an investigation at rates of \$150 to \$200 per hour; and (3) Service staff will spend 4 to 10 hours at \$100 to \$150 per hour responding to inquiries from each landowner.

5.i. Subsistence

Public comment suggested that critical habitat designation could have an impact on subsistence activities and that this impact should be measured because it was done in other economic analyses. The DEA did not address the potential indirect impact of subsistence activities on the proposed critical habitat for the O‘ahu Plants for three reasons. First, subsistence activity is less extensive on O‘ahu and less important economically than it is on the other islands. This reflects the fact that O‘ahu has a comparatively large and diverse economy. Second, much of the subsistence hunting that does take place on O‘ahu is also recreational hunting, which is addressed in the DEA. Third, the DEA did not expect critical habitat to affect subsistence activities and the subsistence lifestyle. Nevertheless, in response to public comment, this Addendum provides the analysis below.

Subsistence Activities

Defined narrowly, subsistence activities within the intended critical habitat consist of the non-commercial and non-recreational harvest of game (e.g., pigs and birds), forest plants, aquatic species in streams, and other products of the land for personal or communal use. The subsistence lifestyle also includes the processing of these products for food, clothing and other uses as well as sharing or exchanging these products with others in the community. Defined more broadly, subsistence includes a lifestyle choice.

In early Native Hawaiian life, gathering activities supplemented the cultivated food and medicinal staples of the people, helped people survive in times of famine, and allowed harvesting of products for communal use (e.g., trees for canoes). Studies of contemporary subsistence in Hawai‘i have documented subsistence practices and formulated conceptual plans for communities on the islands of O‘ahu, Moloka‘i, Maui and Hawai‘i. Today, subsistence activities can play an important role in community life, including:

- Providing families with essential resources that compensate for low income.
- Preserving traditional Hawaiian cultural values, customs and practices as cultural knowledge. Place names, shrines, methods of gathering and fishing, and the reproductive cycles of resources have been passed down from one generation to the next through training in subsistence skills.
- Providing a link to the traditions and ways of life of previous generations—to the ways of the *kupuna* (elders) and the previous occupants of the land.
- Providing a basis for sharing and gift-giving within the community and reinforcing good relations among members of extended families and neighbors.
- Allowing family members of all ages to contribute to family welfare.
- Fostering conservation because traditional subsistence practitioners are governed by particular codes of conduct intended to ensure the future availability of natural resources.
- Providing a valuable, but relatively inexpensive, form of exercise and stress reduction.
- Increasing the time spent in nature, cultivating a strong sense of environmental kinship.

Governor's Molokai Subsistence Task Force Final Report. Honolulu, Hawai'i. June 1994.

State Protection of Subsistence Rights

Subsistence activities are protected under Article 12, Section 7 of the Hawai'i State Constitution. Specifically, the Constitution reaffirms and protects all rights customarily and traditionally exercised for subsistence, cultural and religious purposes.

Probability of a Prohibition on Subsistence Activities

Chapter VI, Section 4.f of the DEA discussed the possibility that, as a result of a third-party lawsuit, a Federal or State court could mandate conservation management of critical habitat based on the interplay between the Act and State requirements. Conceivably, mandated conservation management could result in the prohibition of subsistence activities in all areas within critical habitat. However, in Section 5.d. above, this analysis concluded that the probability of mandated conservation management is not reasonably foreseeable. Furthermore, given State Constitutional protection of traditional subsistence activities, this analysis estimates that the probability is even lower that subsistence activities will be prohibited in the intended designation.

It is more likely that restrictions on subsistence activities (if any) will occur in small, localized areas that have significant biological importance; i.e., areas containing populations of the Plants. However, because of the strong stewardship and conservation values associated with those

who practice subsistence activities, combined with cultural traditions of protecting environmentally sensitive areas, this analysis anticipates that subsistence activities are likely to be consistent with any conservation restrictions in localized areas.

Potential Impact of a Prohibition on Subsistence Activities

Assuming for illustration that subsistence activities will not be allowed, the resulting economic impact is difficult to estimate. While anecdotal information demonstrates that subsistence hunting and forest and stream gathering play important roles in the cultural and social frameworks of some communities, there is a significant lack of documented information on the practice of subsistence on O‘ahu. For example, information has not been collected on the number of people who practice subsistence, the amount of subsistence harvests, the total nutritional value or the proportion of the daily diet that is gained through subsistence, and the relative importance of various areas for subsistence activities. Second, even if this information were available, typical methods of estimating economic value, such as willingness to pay and travel costs, are of limited use when applied to subsistence.

Summary

In view of the above, this analysis anticipates that there will be no significant impact on subsistence activities as a result of the intended designation.

5.j. Unchanged Indirect Costs

In the cases below, the analyses of indirect costs in the intended units are the same as they appear in the DEA:

- Section 4.b. Management of Game Mammals and Loss of Hunting Lands
- Section 4.j. Condemnation of Property
- Section 4.l. Loss of Conservation Projects

6. COSTS TO SMALL ENTITIES

Under the Regulatory Flexibility Act (RFA)—as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996—whenever a Federal agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.

SBREFA does not explicitly define either “substantial number” or “significant economic impact.” Consequently, to assess whether a “substantial number” of small entities is affected by the proposed designation, the DEA considered the relative number of small entities likely to be impacted in the area. Similarly, the DEA considered whether or not entities incur a “significant economic impact.” The DEA considered only small entities that were expected to be directly regulated by the proposed designation. This approach is consistent with several judicial opinions related to the scope of the RFA (*Mid-Tex Electric Co-Op, Inc. v. F.E.R.C.* and *America Trucking Associations, Inc. v. EPA*).

Of all the entities directly regulated by the proposed designation for the Plants, only the approximately half-dozen ranchers that could be involved in future consultations were considered “small entities.” However, after noting that this could represent approximately 10 percent of the ranching industry on O‘ahu, the DEA concluded that the number of ranchers potentially affected did not represent a “substantial number” of ranchers. Accordingly, the analysis concluded that the proposed designation would not have a significant economic impact on a substantial number of small entities in Hawai‘i.

In the intended designation, the amount of land used for ranching will be less than it was in the proposed designation. In turn, both the number of section 7 consultations involving ranching, and the number of affected ranches will be lower. As mentioned in the ranching section above, the intended designation for the Plants under section 7 of the Act could have a negative impact on about three ranches (about 3 percent of the total ranches on O‘ahu). While the 2002 U.S. Small Business Administration (SBA) publication, *The Regulatory Flexibility Act, An Implementation Guide for Federal Agencies*, does not explicitly define what constitutes a “substantial” number of small entities in the ranching industry, it gives examples of a substantial number being “more than just a few.” It also mentions that five small firms out of an industry of 1,000 small firms is probably not a substantial number, but five small firms out of an industry of 20 small firms would be a substantial number. The three ranchers that could be affected out of approximately 100 small ranchers on Oahu appear to be consistent with the SBA examples of what is less than a “substantial” number. Thus, this analysis concludes that the three ranchers is not a substantial number of the small businesses in the ranching industry on O‘ahu.

No other small entities have been identified as being potentially impacted by the intended designation. Therefore, the intended designation will not have a significant economic impact on a substantial number of small entities in Hawai‘i.

7. SECTION 7-RELATED BENEFITS

The economic analyses of direct section 7-related benefits for the intended designation remain the same as they were in the DEA.

8. INDIRECT BENEFITS

8.a. Ecotourism

Chapter VI, Section 7.e of the DEA observed that ecotourism could benefit from project modifications that enhance the quality of the ecosystem and expand the geographic scope of high-quality ecosystems, thereby increasing the appeal of mountain tours to visitors. Public comment correctly observed that ecotourism would also benefit by project modifications that prevent degradation of the native forest.

8.b. Regional Economic Activity Generated by Conservation Management

Chapter VI, Section 7.f. of the DEA provided an estimate of the amount of economic activity that would be generated by conservation expenditures assuming that all designated lands are managed for conservation. As discussed in Section 5.d. above, this analysis assumes that these expenditures are not reasonably foreseeable.

8.c. Unchanged Indirect Benefits

The economic analyses of indirect benefits for the intended designation remain the same as they were in the DEA for the following sections:

- Section 7.a. Species Preservation
- Section 7.b. Ethnobotanical Benefits
- Section 7.c. Medicinal/Pharmaceutical Benefits
- Section 7.d. Benefits to the Ecosystem

9. PUBLIC COMMENTS

Some reviewers commented that the DEA did not address or did not adequately consider a variety of costs and benefits that they believe could occur as a result of the implementation of section 7 for the Plants. However, the analysis considered many of these possible costs and benefits, and addressed some of them. In some cases, the analysis purposely did not address potential impacts because they are unlikely to occur. We have considered all comments on the economic analyses. When these comments provided new information or raised new concerns, the Addendum revisited the analysis and provided updated estimates as appropriate. The following responses address specific comments that relate to economic impacts of the proposed designation.

9.a. New Money

Comment: The DEA does not indicate that the designation of critical habitat will generate any “new” money. It does show that increased regulation due to designation of critical habitat will

increase economic risks, drive down profits, and drive away potential investors, thereby reducing “new” money entering Hawai‘i.

Response: The DEA states that a portion of the expenditures on conservation management by the Service, NRCS, and the military could be “new” money. Based on State multipliers, each additional \$1 million of new money spent in Hawai‘i would generate approximately \$1.8 million in direct and indirect sales in Hawai‘i, and would support approximately 22 direct and indirect jobs in Hawai‘i (DEA, Chapter VI, Section 7.f.).

Regarding development projects and “new” investment money that could be lost, the DEA noted in Chapter VI, Section 4.h. that: “Over the next 10 years, the number of affected [development] projects is expected to be small because most of the proposed critical habitat units are (1) in mountainous areas that are unsuitable for development due to difficult access and terrain, and (2) within the State Conservation District where land-use controls severely limit development.” The development projects that were addressed in Chapter VI of the DEA included: (1) communications facilities (Sections 3.e. and 4.d.), (2) residential development (Section 3.o.), and (3) a private landfill (Sections 3.p. and 4.e.).

The intended designation does not include the large communications complexes at Palehua and Koko Head, urban land suitable for residential development, or the site for the proposed landfill. Only a few of the smaller communications complexes remain in the intended designation. Because of the small footprints of communications towers and for other reasons, the analysis does not anticipate costly project modifications (Section 3.p).

Thus, the analysis anticipates no significant loss of “new” money.

9.b. Benefits of Species Preservation

Comment: The DEA argues that because critical habitat is mandated by law, it must therefore have economic value. The alleged benefits of species preservation are not economic at all.

Response: As noted in Chapter VI, Section 6.a. of the DEA, “(m)any economic studies have demonstrated benefits associated with the conservation and recovery of endangered and threatened species and their ecosystems.

“However, the additional economic benefits of conservation and recovery that would be attributable to the designation of critical habitat are difficult to estimate because of the scarcity of (1) scientific studies on the magnitude of the recovery and ecosystem changes resulting from the critical habitat designation, and (2) economic studies on the per-unit value of many of the changes. ... And while some economic studies been done on the per-unit value of some of these changes, studies have not been done for most.”

“As a result, it is not possible, given the information that is currently available, to estimate the value of many of the benefits that could be ascribed to critical habitat designation.”

9.c. Indirect Costs

Comment: The DEA dismisses the “worst-case” impacts and does not consider the major adverse impacts from secondary effects or indirect costs. Indirect costs are not considered in the bottom line analysis of the cost of designating critical habitat.

Response: Chapter VI, Section 4 of the DEA and Section 5 of the Addendum discuss various indirect costs that can result from the critical habitat designation. These indirect costs are not “worst-case” estimates. Instead, most of them are conditioned upon actions and decisions by the State, the county, investors, etc. Because critical habitat has a limited history in Hawai‘i, and other states have environmental laws that differ from Hawai‘i laws, uncertainty exists regarding the outcome of these actions and decisions.

Also, these indirect impacts are not dismissed. Rather, they receive the same importance as direct costs receive. The reason the indirect costs are not summed is that many of them should be weighted by the probability of occurrence, but information is not available to determine these probabilities beyond a subjective estimate. As indicated in the DEA, several of the probabilities are “small.” In the case of property values, a loss is expected, but uncertainty exists over the magnitude of this loss.

9.d. Biological and Environmental Benefits

Comment: One commenter stated that the DEA lacks a thorough benefits analysis. Multiple commenters stated that the DEA ignored the benefit of keeping other native species off the endangered species list, of maintaining water quality and quantity, of promoting ground water recharge, and of preventing siltation of the marine environment, thus protecting coral reefs. Another commenter noted that additional benefits of critical habitat include combating global warming, providing recreational opportunities, attracting ecotourism, and preserving Hawai‘i’s natural heritage. Although the DEA makes general observations of the benefits associated with designating critical habitat, it makes no attempt to quantify these acknowledged benefits. The Service must use the tools available such as a University of Hawai‘i Secretariat for Conservation Biology study that estimated the value of ecosystem services, to determine the benefits of critical habitat. On the other hand, one commenter stated that the DEA overestimates economic benefits and many of the alleged benefits are entirely speculative, unquantifiable or lack any commercial value.

Response: Chapter VI, Sections 6 and 7 of the DEA discussed potential direct and indirect benefits that can result from the proposed designation, including those addressed in the above comment. However, the DEA also indicated that these benefits are not quantified due to lack of information on the value of the environmental benefits that would be attributable specifically to the critical habitat designations (i.e., the benefits over and above those which will occur due to other

existing protections, and over and above the benefits from other conservation projects). Specifically, there is a lack of (1) scientific studies regarding ecosystem changes due to critical habitat, and (2) economic studies on the per-unit value of many of the changes.

The 1999 analysis by University of Hawai'i (UH) economists on the total value of environmental services provided by O'ahu's Ko'olau Mountains was in fact used in the DEA as a resource document for concepts, for identifying documents that report the original research on certain subjects, and for illustrating the economic value of an assumed incremental increase in environmental services.

However, as noted in the DEA, estimating the total value of the ecosystem services provided by the Ko'olau Mountains is a difficult task, requiring some assumptions that are open to challenge, including estimates of the magnitude of the environmental services provided by the Ko'olau Mountains and estimates of the per-unit value of each service. Also, the UH study does not address all of the benefits of the Ko'olau Mountains or any of the benefits of the Wai'anae Mountains.

More to the point, the UH study has limited applicability for valuing the benefits of the intended designation for the Plants. Since the purpose of the UH study was to estimate the total value of environmental benefits provided by the entire Ko'olau Mountains on the island of O'ahu, it does not address the value of the more limited benefits provided by the intended critical habitat for the O'ahu Plants. Specifically, the UH study provides no estimates of the changes in biological and environmental conditions resulting from changes in land management due to critical habitat designation.

In any case, the DEA reported that the value of the ecosystem services provided by the Ko'olau is very large. Since the intended designation covers nearly all of the Ko'olau Mountains, as well as parts of the Wai'anae Mountains, and since some project modifications can affect large portions of the mountains, even a very small percentage improvement to ecosystem services can translate into large economic benefits.

In summary, the discussion presented in the DEA on the biological and environmental benefits of critical habitat designation provides an overview of potential benefits, but the Service did not intend for it to provide a complete quantitative analysis of the benefits. Instead, the Service believes that the benefits of critical habitat designation are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.

9.e. Benefits to Developers

Comment: Treating "better siting of projects by developers so as to avoid costly project delays," as an economic benefit is circular. The costly project delays result from regulations. They could be avoided by not imposing the regulations in the first place.

Response: As noted in Chapter VI, Section 6.c. of the DEA, the benefit applies to proposed units or portions of units that the Service regards as *occupied*. Even without critical habitat, developers must consult with the Service on projects that have *Federal involvement* and which affect listed species. By knowing the critical habitat boundaries, and if developers have the flexibility, they can site projects outside the boundaries, thereby avoiding certain issues related to threatened and endangered species. But even if there is no flexibility in siting a project, it can still be helpful to developers to know the boundaries of a critical habitat unit. If a project is located outside the unit boundaries, then the developer can proceed with project planning with less risk of facing issues related to critical habitat. On the other hand, if a project is located inside a critical habitat boundary and there is *Federal involvement*, then the developer and action agency could enter into informal consultations with the Service before proceeding with detailed site plans.

Since the discussion applies only to areas that are *occupied* and would be subject to regulation with or without critical habitat, the logic for the benefit to developers is not circular.

9.f. Economic Value of Conservation

Comment: The DEA fails to adequately address the economic value represented by the time, money, and energy that the people of Hawai‘i invest in the conservation of native Hawaiian plants, including the ethnobotanical value of these plants to the culture of Native Hawaiians.

Response: Chapter VI, Sections 6 and 7 of the DEA discussed the benefits of critical habitat. While the time, money and energy that the people of Hawai‘i invest in the conservation of native plants could function as an indicator for residents’ “willingness to pay” to protect these species, this information has not been gathered or analyzed comprehensively and, given the scope of the economic analysis, no primary economic research was conducted. Moreover, as noted in the DEA, even if this information were available, the value of these benefits attributable to critical habitat designation would still be difficult to estimate because of the scarcity of (1) scientific studies on the magnitude of the recovery and ecosystem changes resulting from the critical habitat designation, and (2) economic studies on the per-unit value of many of the changes.

9.g. Methodology

Comment: The analysis used in the DEA for O‘ahu is not consistent with the analysis used in the DEA for the Island of Hawai‘i. The Service should use a consistent methodology in all of its economic analyses.

Response: This specific comment objected to differences in the methodology used to estimate direct economic costs related to Army activities and the fact that the estimated costs were much lower for O‘ahu. The economic analysis for both O‘ahu and the Big Island used the same methodology. But the direct costs were lower for O‘ahu because of: (1) differences in the extent of the overlap between the proposed designations and the Army installations on O‘ahu versus the installation on the Big Island; (2) differences in the planned military uses of land in the proposed

designations; and (3) differences in information available to the analysts regarding project modifications. The Addendum revisits the direct costs associated with Army activities and revises them based on updated information.

9.h. Impact to Private Landowners

Comment: One private landowner states that designated critical habitat affects over half of his land holdings and will result in impacts to land value, extraordinary levels of governance and long-term economic impacts.

Response: For grazing land in critical habitat, the DEA addressed the possible direct section 7 costs for ranching activities (DEA, Chapter VI, Section 3.h); the indirect impacts of critical habitat on State and county development approvals (DEA, Chapter VI, Section 4.h); and the possible loss of property value (DEA, Chapter VI, Section 4.i).

Because the intended critical habitat would cover less grazing land than the proposed critical habitat, the Addendum revisited the possible direct section 7 costs on ranching activities and the potential loss of property value (Sections 4.e and 5.g, respectively). For about 2,070 acres of privately owned Agricultural land in the intended critical habitat, the analysis found that the loss in property value would be a small to moderate fraction of \$18.6 million.

9.i. Subsistence Activities

Comment: The DEA ignores the topic of subsistence gathering.

Response: The DEA did not address the potential indirect impact of the proposed critical habitat designation on subsistence activities for three reasons. First, subsistence activity is less extensive on O‘ahu and less important economically than it is on the other islands. This reflects the fact that O‘ahu has a comparatively large and diverse economy. Second, much of the subsistence hunting that does take place on O‘ahu is also recreational hunting, which is addressed in the DEA. Third, the DEA did not expect critical habitat to affect subsistence activities and the subsistence lifestyle.

Nevertheless, in response to the comment, the Addendum addresses subsistence activities. The analysis found that it is unlikely that new or additional restrictions on access and prohibitions on subsistence will result from critical habitat designation. This assessment is partly based on the Hawai‘i State Constitution which protects traditional subsistence activities.

The analysis estimates that it is more likely that restrictions (if any) will occur in small, localized areas that have significant biological importance; i.e., areas containing populations of the Plants. However, because of the strong stewardship and conservation values associated with those who practice subsistence activities, combined with the cultural tradition of protecting environmentally sensitive areas, subsistence activities are likely to be consistent with any conservation restrictions in localized areas.

Thus, the analysis anticipates no significant impact on subsistence activities as a result of the intended designation.

9.j. State Redistricting of Land to Conservation

Comment: Several commenters stated the following: The DEA fails to consider economic impacts of critical habitat that result through interaction with State law, specifically Hawai‘i’s Land Use Law. Critical habitat could result in downzoning under State law. Hawai‘i Revised Statutes (HRS) §205-2(e) states that conservation districts shall include areas necessary for conserving endangered species. HRS §195D-5.1 states that DLNR shall initiate amendments in order to include the habitat of rare species. Even if DLNR does not act, the Land Use Commission (LUC) might initiate such changes, or they might be forced by citizen lawsuits. Areas for endangered species are placed in the protected subzone with the most severe restrictions. While existing uses can be grandfathered in, downzoning will prevent landowners from being able to shift uses in the future, reduce market value, and make the land unmortgageable. Although the Service acknowledges that there could be substantial indirect costs relating to redistricting of land to the Conservation District, several commentators disagreed with the characterization of these costs as unlikely. The DEA fails to consider additional third-party lawsuits to force redistricting of lands into the conservation district.

Response: Chapter VI, Section 4.g. of the DEA and Section 5.e. of the Addendum discuss possible costs associated with redistricting land in critical habitat.

Most of the land in the Urban District and much of the land in the Agricultural District initially proposed for designation are removed in the intended designation. As indicated in Section 5.e. of the Addendum, the intended designation includes (1) approximately 3,319 acres of Agricultural land, of which 2,070 acres are privately owned; and (2) approximately 0.6 acre of Urban land, of which about 0.2 acre is privately owned.

Under a worst-case scenario, where all land in the Agricultural District is redistricted to Conservation, the reduction in land values would be approximately \$18.6 million.

However, as discussed more fully in Chapter VI, Section 4.g. of the DEA and Section 5.e. of the Addendum, agency-initiated and court-ordered redistricting of some of the privately owned land is reasonably foreseeable (moderate to high probability). Further, this analysis judges the probability that all of the parcels will be redistricted to be very low to low. Tables ES-1 and VI-3

in the DEA characterized the risk of redistricting all of the parcels in the proposed designation as “undetermined,” not as “unlikely.” To more accurately reflect the analysis, this analysis changes the probability to “very low to low.” But even if land is not redistricted, the DEA and the Addendum noted that the State may seek agreements with landowners to protect the habitats of listed species in order to retain existing District designations.

The DEA recognized that a real or perceived risk of redistricting can cause a loss of land value that continues until the uncertainty is resolved by (1) the passage of time that reveals the extent of redistricting due to critical habitat, or (2) possibly a State court decision on issues raised by critical habitat designation. Over the long-term, a permanent loss of land value (if any) would depend on how the uncertainty is resolved.

9.k. New Mexico Cattlegrowers Association Ruling

Comment: The Service has failed to mention the Federal court ruling on the New Mexico Cattlegrowers Association vs. U.S. Fish and Wildlife Service, which requires consideration of the impact of listing as well as the impact of designating an area as critical habitat.

Response: The DEA and the Addendum considered the economic impacts of section 7 consultations related to critical habitat even if they are attributable coextensively to the listed status of the species. In addition, the DEA and the Addendum examined the indirect costs of critical habitat designation; e.g., the relationship between critical habitat designation and a State or local statute.

9.l. Take Provision under State Law

Comment: Any activity that could degrade critical habitat, including activities that are not subject to section 7 consultation, could be seen as an “injury” to (and therefore, under State law, a “taking” of) an endangered plant species under the State of Hawai‘i’s endangered species law (Chapter 195D). It is important that this receive due consideration in evaluating the proposed critical habitat designations (for example, in completing the economic analysis), and that the Service explain to what extent it has considered the potential interplay between the Federal Endangered Species Act and Hawai‘i endangered species laws.

Response: Chapter VI, Sections 4.b. and 4.f of the DEA and Section 5.d. of the Addendum discuss possible indirect costs resulting from the interplay of the Federal Endangered Species Act and Hawai‘i State law (e.g., court-ordered mandates to manage private lands for conservation of the Plants, or to reduce game-mammal populations that harm Plants or their habitats). Both the DEA and the Addendum considered the economic impacts of section 7 consultations related to critical habitat even if they are attributable coextensively to the listed status of the species. In addition, the DEA and the Addendum examined any indirect costs of critical habitat designation. However, the impacts are not attributable to critical habitat designation when the listing of a species prompts action at the State or local level. *Take* prohibitions under Hawai‘i law are purely attributable to a

listing decision and do not occur as a result of critical habitat designations. There are no *take* prohibitions associated with the Plants critical habitat.

9.m. Takings of Private Property

Comment: Several commenters stated the following: The Service did not adequately address the takings of private property as a result of designating critical habitat for endangered plants on O‘ahu. If the proposed designation of critical habitat precipitates conversion of agricultural lands to conservation land that has no economically beneficial use, then the Federal and State governments will have taken private property.

Response: Chapter VI, Section 4.g. of the DEA and Section 5.e. of the Addendum address costs involved in redistricting lands from the Agricultural District to the Conservation District. About 3,319 acres of the intended designation are in the Agricultural District, 2,070 acres of which are privately owned. In the event that all of these lands are redistricted to the Conservation District, the loss in land value would be approximately \$18.6 million.

However, as discussed more fully in Chapter VI, Section 4.g. of the DEA and Section 5.e. of the Addendum, agency-initiated and court-ordered redistricting of some of the privately owned land is reasonably foreseeable (moderate to high probability). But more to the point, any redistricting of land to Conservation, and any corresponding loss of economically beneficial use, would be decided by the LUC and the courts based on an array of State statutory factors, not the Service. As such, the Federal government would not have taken private property.

9.n. Federal Involvement

Comment: Several commenters stated the following: While the Service has stated that critical habitat affects only activities that require Federal permits or funding, and does not require landowners to carry out special management or restrict use of their land, this fails to address the breadth of Federal activities that affect private property in Hawai‘i and the extent to which private landowners are required to obtain Federal approval before they can use their property. These requirements also extend to State agencies requiring Federal funds or approvals.

Response: As discussed in Chapter V, Section 2.b. of the DEA, not every single project, land use, and activity that has a *Federal involvement* has historically been subject to section 7 consultation with the Service (e.g., a Federally guaranteed mortgage). Thus, the analysis was confined to those projects, land uses, and activities which are, in practice, likely to be subject to consultation. The analysis based this assessment on a review of past consultations, current practices, and the professional judgments of Service staff and other Federal agency staff.

9.o. Hawai‘i Endangered Species Act

Comment: Several commenters stated the following: The impact of the proposed designations under State law is potentially more extensive than under Federal law since the Act contains at least general criteria for determining when alteration of critical habitat constitutes “destruction or adverse modification.” The lack of analogous provisions under State law lends itself to a much broader interpretation of what activities might be considered injurious to the species (and therefore prohibited). One commenter asked if, to the extent that the Service has considered the potential interplay between the Act and State statutes, whether the Service is aware of any circumstances where similar issues have been raised under other State conservation statutes when critical habitat was designated. Another commenter noted, however, that because Hawai‘i’s land use laws are uniquely onerous, precedent from other states is of little value. The current wave of proposals to designate critical habitat are the first time that the Act has been applied to significant areas of private land in Hawai‘i. Consequently, even prior experience in Hawai‘i is of little relevance.

Response: The DEA and the Addendum discuss costs resulting from the interplay of the federal Endangered Species Act and Hawai‘i State law in the sections on Indirect Costs. The uncertainties regarding the occurrence of many indirect costs and their magnitudes reflect the lack of experience in Hawai‘i with critical habitat.

9.p. Hawai‘i Environmental Impact Statement Law

Comment: Several commenters stated the following: The DEA fails to consider economic impacts of critical habitat that result through interaction with State law, specifically Hawai‘i’s Environmental Impact Statement Law. HRS §343-5 applies to any use of conservation land, and a full Environmental Impact Statement is required if any of the significance criteria listed in Hawai‘i Administrative Rule 11-200-12 apply. One of these criteria is that an action is significant if it “substantially affects a rare, threatened or endangered species or its habitat.” This will result in costly procedural requirements and delays. However, the DEA does not acknowledge that any impact on endangered species habitat will be deemed to be “significant.” In addition, multiple commenters stated that the DEA fails to evaluate the practical effect critical habitat designation will have on development. Special Management Area permits administered by the City & County of Honolulu as required by Hawai‘i’s Coastal Zone Management Act will be harder to get, will result in delays, will cause a decline in property values and might make it impossible to develop. This economic impact disappears because the DEA’s bottom line erroneously counts only so-called “direct” costs of consultation.

Several commenters also stated the following: The Service has taken the position in other states that it has a right to intervene in local land use proceedings if they affect endangered species on private property, as evidenced by the Service's petition to the local zoning board in Arizona to postpone approval of a rezoning petition pending a survey to determine the extent to which an endangered plant was present on the property even though no Federal approval was being sought. That the Service does not address these activities in the DEA is a fundamental error of the analysis.

Response: Chapter VI, Section 4.h. of the DEA discussed additional State and county environmental review that would be required for projects in critical habitat.

However, as mentioned in the Addendum, even with the added State and county environmental review, the intended designation will have little or no practical effect on residential, resort, commercial, or industrial development because the analysis anticipates that no such development will occur in the intended critical habitat. Reasons for this are: (1) most of the intended critical habitat is in mountainous areas that are unsuitable for development due to difficult access and terrain; (2) approximately 96 percent of the intended designation is in the State Conservation District where existing land-use controls severely limit development; (3) almost all of the remaining Agricultural land in the intended designation is in areas that are not subject to development pressure because of steep slopes and little or no nearby infrastructure; (4) the small amount of land in the Urban District (0.6 acre) is on steep slopes that cannot support development; and (5) all of the land intended for critical habitat designation that is in the Special Management Area is also within the Conservation District.

9.q. Stream Diversions

Comment 1: Several commenters stated the following: The DEA fails to consider economic impacts of critical habitat that result through interaction with State law, specifically the State Water Code. HRS §174C-2 states that "adequate provision shall be made for protection of fish and wildlife. HRS §174C-71 instructs the Commission of Water Resource Management to establish an instream use protection program to protect fish and wildlife. Since landowners might depend on water pumped from other watersheds, these effects can be far-reaching. It is impossible to tell from the descriptions in the proposal whether any water diversions will have to be reduced as a result of listing and critical habitat designation. It is unfair to dismiss costly but vital sources of energy and inexpensive irrigation water while maintaining the highest level of effort to protect *primary constituent elements* for species that do not physically reside in the area but might somehow be transported. If the critical habitat proposal would require reducing water diversions from any stream, the Service should investigate whether that would take anyone's vested water rights. The Service has an obligation to thoroughly investigate this issue and refrain from designating critical habitat until it has determined whether its actions will affect water use. At minimum, portions of specific parcels that include water sources or water systems should be removed.

Response: The Service indicates that none of the Plants in the intended designation is aquatic. The Plants rely on rainwater that percolates down through the substratum and is absorbed

by the plant roots. Thus, the critical factors that affect the habitat of the listed plants are local rainfall and localized surface runoff. Furthermore, the Service indicates that it is unable to document extinction of Hawaiian plants due to water diversions.

Also, existing irrigation ditch systems and potable water systems are man-made features that to not contain the *primary constituent elements* for the Plants. Because the Service does not include these man-made features in critical habitat designations, the intended designation will not affect the operation and maintenance of irrigation and potable water systems (DEA, Chapter II, Section 4).

Regarding new stream diversions, Chapter VI, Section 3.j. of the DEA stated that it is highly unlikely that new or expanded ditch systems would be proposed or approved within the proposed designation because it would directly or indirectly reduce stream flow, which is a major environmental concern. But if a stream diversion were to be proposed, critical habitat designation might result in an expanded biological assessment, project delays, project modifications, and an increased probability of denial (DEA, Chapter VI, Section 4.f.). However, without more specific information on the scope and location of a future (and currently unplanned) stream diversion project, it is not possible to estimate the potential indirect costs.

Comment 2: Any water diversion in or upstream of critical habitat will be challenged by people who oppose all diversions on principle. They will contend that diverting water from endangered plants risk driving them to extinction. Opponents of diversions could use the critical habitat designations to invent a colorable argument sufficient to delay and confuse water use decisions.

Response: See the response to the previous comment.

9.r. Cost to Investigate the Implications of Critical Habitat

Comment: The draft fails to recognize that the indirect costs to private landowners to investigate the implications of critical habitat on their lands are sunk costs associated with the designation process.

Response: Chapter VI, Section 4.k. of the DEA indicated that landowners might want to learn how the designation may affect (1) the use of their land (either through restrictions or new obligations), and (2) the value of their land. The cost-estimate to investigate the implications of critical habitat was \$80,000 to \$400,000.

Section 5.g of the Addendum revised the estimate to reflect the reduction in the number of potentially affected landowners as a result of the intended modifications to the critical habitat. The revised estimate ranges between \$26,500 and \$227,500. For completeness, the estimate includes expenditures made during the designation process (i.e., sunk costs) and expenditures that will be made after the final designation.

10. SUMMARY OF ECONOMIC IMPACTS

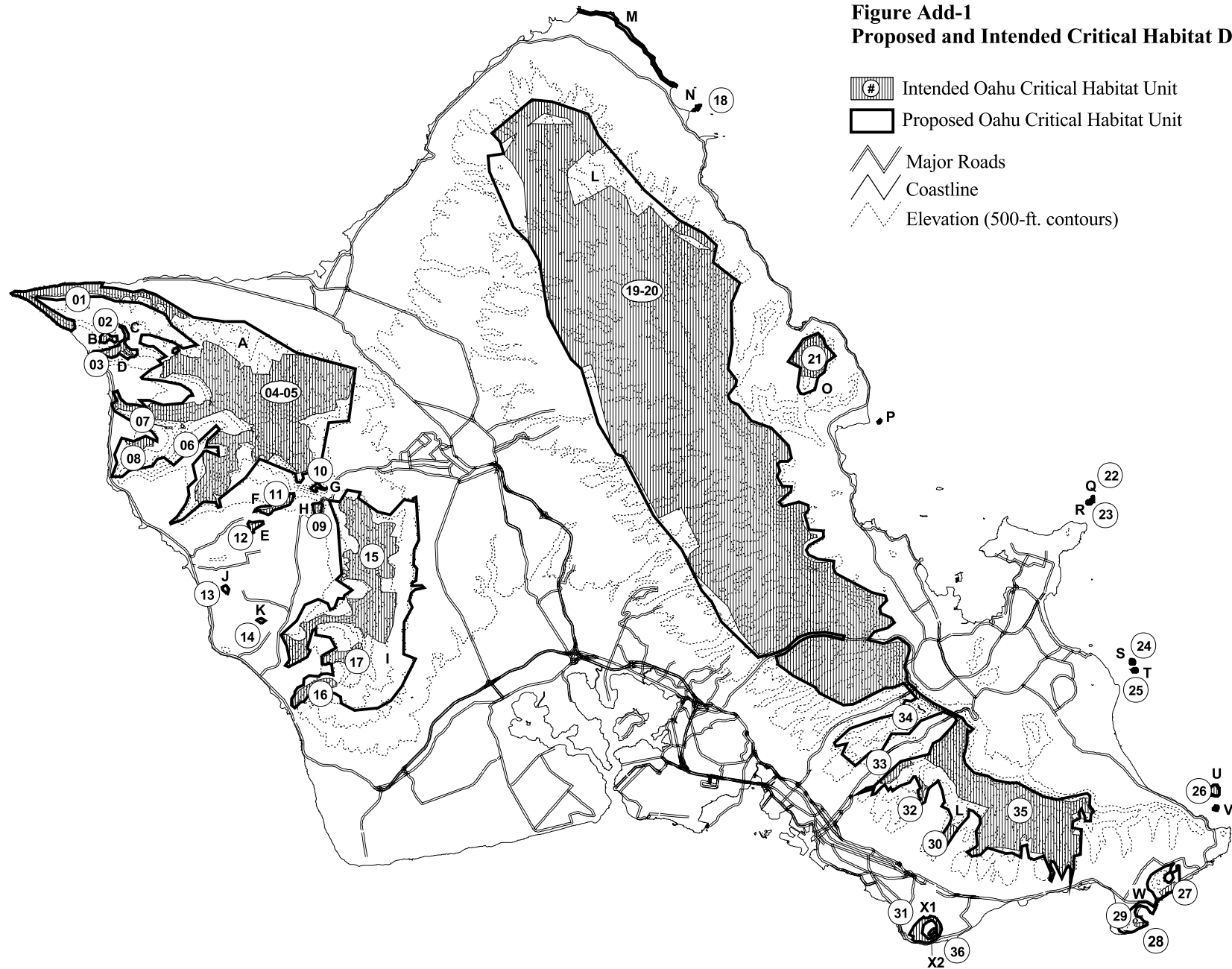
Table ES-1 of the DEA, which also appears as Table VI-3 in Chapter VI of the DEA, presented the costs and benefits attributable to the listing of the Plants and the proposed critical habitat. The columns in Table Add-2 provide: (1) the original low and high estimates of costs and benefits presented in the DEA for the proposed critical habitat; (2) revised low and high estimates from this Addendum based on the intended critical habitat, issues raised in public comments on the DEA, and new information obtained since the DEA was published; and (3) an Explanation for each change, as appropriate. At the end of the section in the table on "Direct Section 7 Costs," the row figures give "Total Direct Costs," "Average Annual Direct Costs," and "Present Value" of these costs based on a 7-percent discount rate. Corresponding totals and related figures are not developed for the sections in the table on "Indirect Costs" and "Direct and Indirect Benefits" because of uncertainty about whether individual costs or benefits will occur, and/or uncertainty about their magnitudes.

The table shows changes in the direct costs associated with the James Campbell National Wildlife Refuge flood control project, the Palehua and Koko Head communications complexes, ranching, residential development, and Army activities. These changes are based on: (1) the decision by the Service to remove or reduce the size of many of the proposed units for biological reasons, and (2) updated information from the Army and the Service on anticipated consultations and project modifications. As a result of these changes, the total direct costs increase from the range of \$1.1 to \$2.4 million in the DEA, to a range of \$8.3 to \$20.3 million in the Addendum. The increase is due to revised estimates associated with the Army lands. All other direct costs stay the same or decrease.

The analysis in the Addendum greatly reduces many of the expected and potential indirect costs because of the Service's intended modifications to the proposed critical habitat, or because the consultants received new information since the DEA was published. The analysis therefore concluded in the Addendum that: (1) the risk of losing important communications facilities is greatly reduced because the Palehua and Koko Head communications complexes are not included in the intended designation; (2) the risk to the proposed private landfill is eliminated because the site is outside the intended designation; (3) mandated conservation management of all lands in critical habitat is not reasonably foreseeable; (4) the potential loss of property values is much lower because much less land is at risk of being redistricted to Conservation; and (5) the cost to investigate critical habitat is lower because fewer landowners will be affected. In addition, in response to public comment, the Addendum includes an assessment of the impact of critical habitat on subsistence activities; the results of the assessment indicate that the impact will be minor.

All of the direct and indirect benefits remain unchanged with one exception. Namely, the Addendum does not provide an assessment of economic activity generated by court-mandated conservation management because it is not considered to be reasonably foreseeable.

Figure Add-1
Proposed and Intended Critical Habitat Designations



**Table Add-1. O'ahu Plants Proposed and Intended Critical Habitat:
Acreage Differences by Unit, State Districting, and Land Ownership**

Item	Proposed Critical Habitat (acres)	Intended Critical Habitat (acres)	Change (acres)
Total	111,364	82,396	28,968
Unit			
A	21,013	11,819	9,194
B	83	58	25
C	35	-	35
D	271	186	85
E	94	93	1
F	200	131	69
G	40	35	5
H	68	68	-
I	12,623	4,834	7,789
J	25	25	-
K	18	18	-
L	74,301	63,835	10,466
M	246	-	246
N	12	12	-
O	1,066	772	294
P	3	-	3
Q	3	3	-
R	15	15	-
S	12	12	-
T	9	9	-
U	67	67	-
V	10	-	10
W	840	106	734
X1	290	287	3
X2	21	15	6
State Land Use District*			-
Conservation	100,092	79,076	21,016
Agricultural	10,937	3,319	7,618
Urban	392	1	391
Land Ownership* **			-
Federal	15,598	11,779	3,819
State/County	39,422	27,630	11,792
Private	56,345	42,888	13,457

* Entries may not sum to total due to digital mapping discrepancies and rounding.

** Land ownership data has been updated.

**Table Add-2. Revised Section 7 Costs and Benefits Attributable to the
O'ahu Plants Listing and Critical Habitat**
(10-year estimates)

CH = critical habitat PMs = project modifications O&M = operation and maintenance Fed = Federal ne = not estimated n/c=not calculated

Item	DEA		Addendum		Explanation
	Low	High	Low	High	
DIRECT SECTION 7 COSTS					
Management of Game Hunting					
Consultations	\$ 6,400	\$ 12,700	\$ 6,400	\$ 12,700	No change
PMs	\$ 37,400	\$ 74,800	\$ 37,400	\$ 74,800	
State and County Parks					
Diamond Head, Consultations	\$ 8,100	\$ 8,100	\$ 8,100	\$ 8,100	No change
Diamond Head, PMs	Minor	Minor	Minor	Minor	
Haiku Valley	\$ -	\$ -	\$ -	\$ -	No change
Aina Haina Nature Preserve	\$ -	\$ -	\$ -	\$ -	Area removed for biological reasons, but no change in costs
Watershed Projects					
Ko'olau Mountains Watershed Partnership, Consultations	\$ 15,700	\$ 47,100	\$ 15,700	\$ 47,100	No change
Ko'olau Mountains Watershed Partnership, PMs	Minor	Minor	Minor	Minor	
BWS West Honolulu Watershed, Consultations	\$ 24,500	\$ 24,500	\$ 24,500	\$ 24,500	No change
BWS West Honolulu Watershed, PMs	Minor	Minor	Minor	Minor	
Ala Wai Watershed Association, Consultations	\$ -	\$ 31,400	\$ -	\$ 31,400	No change
Ala Wai Watershed Association, PMs	Minor	Minor	Minor	Minor	
Conservation Projects					
O'ahu Forest NWR, Consultations	\$ 5,100	\$ 10,000	\$ 5,100	\$ 10,000	No change
O'ahu Forest NWR, PMs	Minor	Minor	Minor	Minor	
James Campbell NWR/Flood Control, Consultations	\$ 8,000	\$ 11,900	\$ -	\$ -	Area removed for biological reasons
James Campbell NWR/Flood Control, PMs	Minor	Minor	\$ -	\$ -	
Honouliuli Preserve, Consultations	\$ -	\$ 49,000	\$ -	\$ 49,000	No change
Honouliuli Preserve, PMs	Minor	Minor	Minor	Minor	
Other Conservation Activities, Consultations	\$ 47,100	\$ 157,000	\$ 47,100	\$ 157,000	No change
Other Conservation Activities, PMs	Minor	Minor	Minor	Minor	
Communications Facilities					
Palehua, Consultations	\$ 81,000	\$ 97,000	\$ -	\$ -	Area removed for biological reasons
Palehua, PMs	\$ -	\$ 120,000	\$ -	\$ -	
Koko Head, Consultations	\$ 8,100	\$ 8,100	\$ -	\$ -	Area removed for biological reasons
Koko Head, PMs	Minor	Minor	\$ -	\$ -	
Diamond Head, Consultations	\$ 5,200	\$ 5,200	\$ 5,200	\$ 5,200	No change
Diamond Head, PMs	Minor	Minor	Minor	Minor	
Other Communications Facilities, Consultations	\$ 24,300	\$ 186,000	\$ 24,300	\$ 186,000	No change
Other Communications Facilities, PMs	\$ -	\$ 100,000	\$ -	\$ 100,000	
Power Transmission Lines	None	None	None	None	No change
Farming	None	None	None	None	No change
Ranching					
Consultations	\$ -	\$ 86,100	\$ -	\$ 54,700	Reduced grazing acreage in intended CH
PMs	Minor	Minor	Minor	Minor	
Aquaculture	None	None	None	None	Area removed for biological reasons, but no change in costs

**Table Add-2. Revised Section 7 Costs and Benefits Attributable to the
O'ahu Plants Listing and Critical Habitat**
(10-year estimates)

CH = critical habitat PMs = project modifications O&M = operation and maintenance Fed = Federal ne = not estimated n/c=not calculated

Item	DEA		Addendum		Explanation
	Low	High	Low	High	
Irrigation-Ditch Systems					
Consultations	\$ -	\$ 39,000	\$ -	\$ 39,000	No change
PMs	Minor	Minor	Minor	Minor	
Potable-Water Systems	None	None	None	None	No change
Highways					
Consultations	\$ -	\$ 16,200	\$ -	\$ 16,200	No change
PMs	Minor	Minor	Minor	Minor	
Hiking Trails and Unpaved Access Roads	None	None	None	None	No change
Ecotourism	None	None	None	None	No change
Residential Use and Development					
Consultations	\$ -	\$ 24,300	\$ -	\$ -	Areas with potential for development removed for biological reasons
PMs	Minor	Minor	\$ -	\$ -	
Landfill	None	None	None	None	Area removed for biological reasons, but no change in costs
U.S. Military--Army					
Dillingham Military Reservation, Consultations	\$ 14,400	\$ 15,200	n/c	n/c	Costs estimated for all Army installations on O'ahu based on additional information
Dillingham Military Reservation, PMs	Minor	Minor	n/c	n/c	
Fort Shafter, Consultations	None	None	n/c	n/c	
Kahuku Training Area, Consultations	\$ 105,000	\$ 153,300	n/c	n/c	
Kahuku Training Area, PMs	\$ 100,000	\$ 200,000	n/c	n/c	
Kawailoa Training Area, Consultations	\$ 23,000	\$ 41,400	n/c	n/c	
Kawailoa Training Area, PMs	\$ 100,000	\$ 150,000	n/c	n/c	
Makua Military Reservation, Consultations	\$ 16,100	\$ 43,400	n/c	n/c	
Makua Military Reservation, PMs	Minor	Minor	n/c	n/c	
Schofield Barracks--West and South Ranges, Consultations	\$ 55,700	\$ 75,800	n/c	n/c	
Schofield Barracks--West and South Ranges, PMs	\$ 200,000	\$ 300,000	n/c	n/c	
Schofield Barracks--East Range, Consultations	\$ 39,800	\$ 49,000	n/c	n/c	
Schofield Barracks--East Range, PMs	\$ 100,000	\$ 150,000	n/c	n/c	
Total Consultations	\$ 254,000	\$ 378,100	\$ 386,700	\$ 571,000	
Total PMs	\$ 500,000	\$ 800,000	\$ 7,700,000	\$ 18,800,000	
U.S. Military--Other					
Hawai'i Army National Guard, DH Crater, Consultations	\$ 10,500	\$ 10,500	\$ 10,500	\$ 10,500	No change
Hawai'i Army National Guard, DH Crater, PMs	Minor	Minor	Minor	Minor	
Navy, NAVMAP PH LLL, Consultations	\$ 17,700	\$ 26,900	\$ 17,700	\$ 26,900	No change
Navy, NAVMAP PH LLL, PMs	Minor	Minor	Minor	Minor	
Navy, RTF Luualualei, Consultations	\$ 10,500	\$ 10,500	\$ 10,500	\$ 10,500	No change
Navy, RTF Luualualei, PMs	\$ 20,000	\$ 40,000	\$ 20,000	\$ 40,000	
Natural Disasters					
Consultations	\$ 3,800	\$ 7,500	\$ 3,800	\$ 7,500	No change
PMs	Minor	Minor	Minor	Minor	
Total Direct Costs	\$ 1,087,400	\$ 2,381,900	\$ 8,323,000	\$ 20,282,100	
Average Annual Direct Costs	\$ 108,740	\$ 238,190	\$ 832,300	\$ 2,028,210	
Present Value (7% discount rate)	\$ 763,744	\$ 1,672,947	\$ 5,845,726	\$ 14,245,295	

**Table Add-2. Revised Section 7 Costs and Benefits Attributable to the
O'ahu Plants Listing and Critical Habitat**
(10-year estimates)

CH = critical habitat PMs = project modifications O&M = operation and maintenance Fed = Federal ne = not estimated n/c=not calculated

Item	DEA		Addendum		Explanation
	Low	High	Low	High	
INDIRECT COSTS					
Management of Game Mammals and Loss of Hunting Lands					
Potential Loss of Benefits to Hunters, Annual	None	\$ 350,000	None	\$ 350,000	No change
Probability	-	Small	-	Low	
Military, Risk to National Security	None	Undetermined	None	Undetermined	Addendum provides additional discussion, but conclusion remains the same
Communications Facilities and Services					
Potential Loss	None	Large	None	Moderate	Premier communication complexes removed for biological reasons, significantly reducing potential for loss
Probability	-	Small	-	Very low	
Landfill					
Potential Cost to find Alternative Site	None	\$ 1,000,000	None	None	Area removed for biological reasons
Probability	-	Significant	-	-	
Mandated Conservation Management					
Potential Cost for Land Management, Annual	None	\$ 3,000,000	n/c	n/c	Count-mandated conservation management of all lands in critical habitat not considered reasonably foreseeable
Loss of Economic Activity (Direct + Indirect Sales), Annual	None	\$ 1,960,000	n/c	n/c	
Probability	-	Small	-	Insignificant	
Redistricting of Urban and Agricultural Land to Conservation					
Potential Loss of Land Value	None	Undetermined fraction of \$ 81,000,000	Undetermined fraction of \$ 18,600,000	Undetermined fraction of \$ 18,600,000	Estimate revised based on intended modifications to CH
Probability of Redistricting <u>Some</u> Parcels	ne	ne	Moderate	High	More accurate summary of analysis
Probability of Redistricting <u>All</u> Parcels	-	Undetermined	Very Low	Low	
State and County Approvals					
Increase in Costs, Delays and Denials	Minor	Significant	Minor	Minor	Few projects expected in the intended critical habitat
Reduced Property Values					
Potential Reduction in Land Values	Significant	Undetermined fraction of \$ 91,000,000	Small fraction of \$ 18,600,000	Moderate fraction of \$ 18,600,000	Estimate revised based on intended modifications to CH and a more accurate summary of analysis
Probability of a Partial Reduction in Value of Some Properties	ne	ne	High	High	More accurate summary of analysis
Condemnation of Property	None	None	None	None	No change
Costs to Investigate Implications of CH	\$ 80,000	\$ 400,000	\$ 26,500	\$ 227,500	Intended reduction in CH reduced number of affected landowners
Impact on Subsistence Activities	n/c	n/c	None	Minor	Analysis added in response to public comment
Loss of Conservation Projects	None	Some	None	Some	No change

**Table Add-2. Revised Section 7 Costs and Benefits Attributable to the
O'ahu Plants Listing and Critical Habitat**
(10-year estimates)

CH = critical habitat PMs = project modifications O&M = operation and maintenance Fed = Federal ne = not estimated n/c=not calculated

Item	DEA		Addendum		Explanation
	Low	High	Low	High	
DIRECT AND INDIRECT BENEFITS					
Benefits of Project Modifications for:					
Site-specific Projects	Significant	Significant	Significant	Significant	No change
Land Management Affecting Large Portions of Mountains	Significant	Large	Significant	Large	No change
Benefits to Developers (For <i>occupied</i> areas, information that allows better project and planning)	Minor	Small	Minor	Small	No change
Species Preservation					
Potential Benefits	Large	Large	Large	Large	No change
Probability	Low	Undetermined	Low	Undetermined	
Ethnobotanical Benefits					
Potential Benefits	Significant	Significant	Significant	Significant	No change
Probability	Low	Undetermined	Low	Undetermined	
Medicinal/Pharmaceutical Benefits					
Potential Benefits	None	Large	None	Large	No change
Probability	-	Undetermined	-	Undetermined	
Benefits to Ecosystem	Significant	Large	Significant	Large	No change
Ecotourism	Small	Significant	Small	Significant	No change
Economic Activity Generated by Conservation Management	Small	Large	n/c	n/c	Count-mandated conservation management of all lands in critical habitat not considered reasonably foreseeable

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⁴ Some references listed in the References section of the DEA were also used in the preparation of this Addendum.

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